IN THE CLAIMS

1. A method for calibrating a flow meter having an array of sensors arranged in relation to a pipe that measures a flow rate of a fluid flowing in the pipe, characterized in that the method comprises the step of:

calibrating the flow rate using a calibration correction function based on one or more parameters that characterize either the array of sensors, the pipe, the fluid flowing in the pipe, or some combination thereof.

2. A method according to claim 1, wherein the calibration correction function depends on either a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D); a Reynolds number ($\rho UD/\mu$) that characterizes the fluid flow in the pipe; a ratio $\Delta x/D$ of the sensor spacing (Δx) and the pipe inner diameter (D); a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the raw flow rate (U_{meas}); or some combination thereof.

3. A method according to claim 2, wherein the flow rate is a volumetric flow rate (Q) and the method includes the step of determining the volumetric flow rate (Q) based on the equation:

$$Q = A * U_{av},$$

where A is a cross sectional area of the pipe's inner diameter and U_{av} is an average flow velocity.

4. A method according to claim 3, wherein the method includes the step of determining the average flow velocity (U_{av}) based on the equation:

U_{av} = the calibration correction function * U_{meas},

where U_{meas} is a measured flow rate.

5. A method according to claim 3, wherein the Reynolds number $\rho UD/\mu$ is defined by a ratio of the fluid density (ρ), the volumetrically averaged flow velocity (U) and the pipe inner diameter (D) in relation to the dynamic viscosity of the fluid (μ).

6. A method according to claim 1, wherein the flow rate includes the velocity of flow.

7. A method according to claim 6, wherein the velocity of flow is determined by using a K-ω plot.

8. A method according to claim 1, wherein the array of sensors includes an array of pressure sensors.

9. A method according to claim 1, wherein the array of sensors includes an array of strain or temperature sensors.

10. A method according to claim 1, wherein the method includes the step of receiving as inputs the one or more parameters.

11. A flow meter having an array of sensors arranged in relation to a pipe that measures a flow rate of a fluid flowing in the pipe, characterized in that

the flow meter comprises a calibration correction function module that calibrates the flow rate using a calibration correction function based on one or more parameters that characterize either the array of sensors, the pipe, the fluid flowing in the pipe, or some combination thereof.

12. A flow meter according to claim 1, wherein the calibration correction function depends on either a ratio t/D of the pipe wall thickness (t) and the pipe inner diameter (D); a Reynolds number (ρUD/μ) that characterizes the fluid flow in the pipe; a ratio Δx/D of the sensor spacing (Δx) and the pipe inner diameter (D); a ratio $f\Delta x/U_{meas}$ of usable frequencies in relation to the sensor spacing (Δx) and the raw flow rate (U_{meas}); or some combination thereof.

13. A flow meter according to claim 12, wherein the flow rate is a volumetric flow rate (Q) and the calibration correction function module determines the volumetric flow rate (Q) based on the equation:

$$Q = A * U_{av},$$

where A is a cross sectional area of the pipe's inner diameter and U_{av} is an average flow velocity.

14. A flow meter according to claim 13, wherein the calibration correction function module determines the average flow velocity (U_{av}) based on the equation:

U_{av} = the calibration correction function * U_{meas},

where U_{meas} is a measured flow rate.

15. A flow meter according to claim 13, wherein the Reynolds number $\rho UD/\mu$ is defined by a ratio of the fluid density (ρ), the volumetrically averaged flow velocity (U) and the pipe inner diameter (D) in relation to the dynamic viscosity of the fluid (μ).

16. A flow meter according to claim 11, wherein the flow rate includes the velocity of flow.

17. A flow meter according to claim 16, wherein the velocity of flow is determined by using a K-ω plot.

18. A flow meter according to claim 11, wherein the array of sensors includes an array of pressure sensors.

19. A flow meter according to claim 11, wherein the array of sensors includes an array of strain or temperature sensors.

20. A flow meter according to claim 11, wherein the method includes the step of receiving as inputs the one or more parameters.